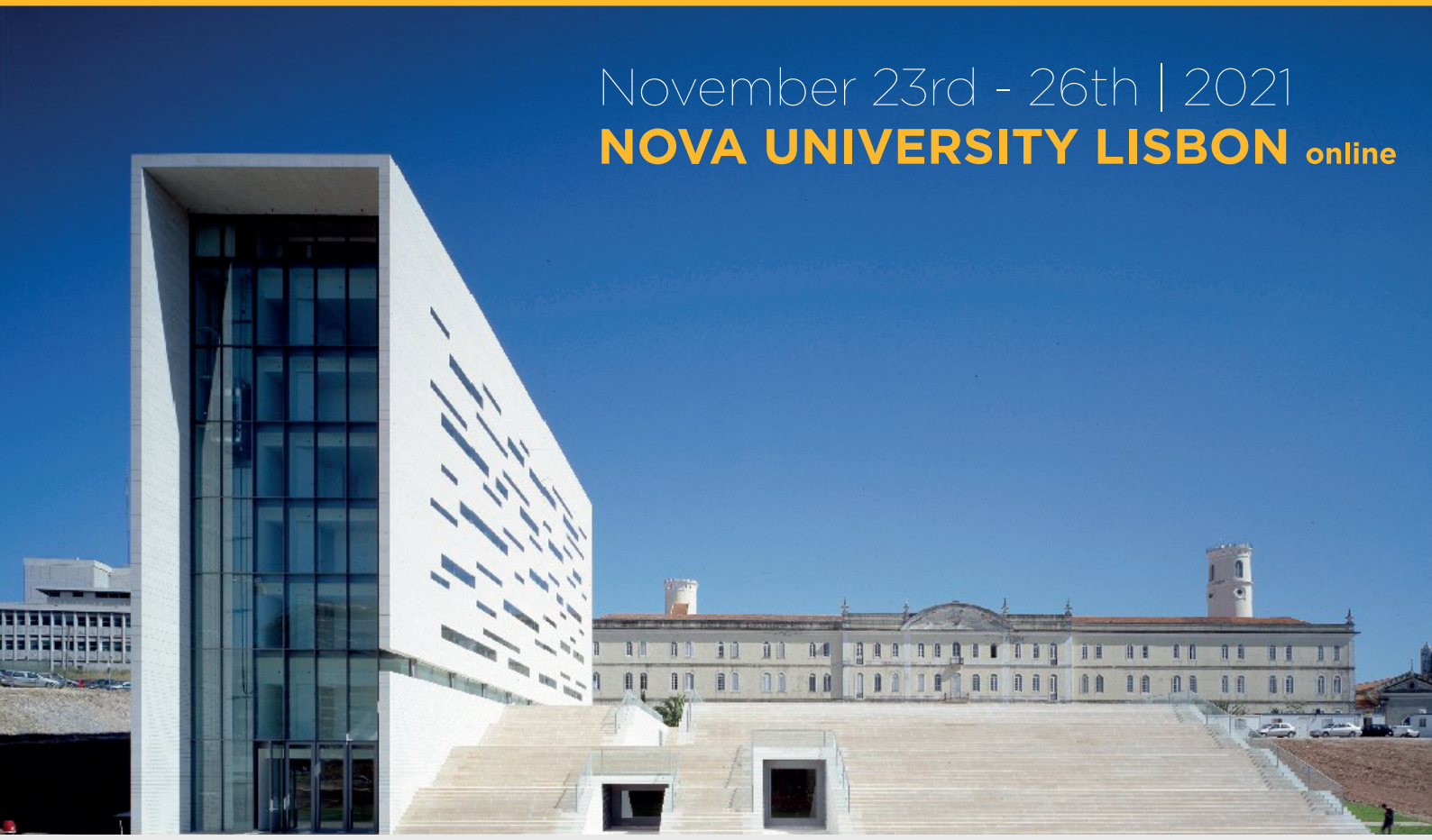
MICRO BIOTEC 21

Webconference

CONGRESS OF **MICROBIOLOGY** AND **BIOTECHNOLOGY 2021**



Abstracts Book

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Organizing Committee ____ *16*

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Plenary Presentations ____ *19*

Topic #1: Microbiotech in Health & Disease ____ **19**

SARS-CoV-2 variants - the steering wheel of public health and governments ____ 19

3D culture strategies to address cell microenvironment remodeling in disease and therapeutic response ____ 20

Topic #2: Microbiotech for a Sustainable Future ____ **21**

Potentials of synthetic biology for fine and speciality chemical production ____ 21

Plenary 4 – Sunil Chandran (Amyris Biotechnologies) ____ 22

Topic #3: Food and Environmental Microbiotech ____ **23**

Antimicrobial resistance in the ecosystem: some recent advances ____ 23

Topic #4: Impact of Microbiotech in Society ____ **24**

Startup Lessons from a Bio-Entrepreneur Turned Investor ____ 24

Topic #5: Cool tools in Microbiotech ____ **25**

Electrochemical detection of single nucleotide polymorphism associated with rifampicin resistance in Mycobacterium tuberculosis using solid-phase primer elongation with ferrocene-linked redox-labelled nucleotides 25

Antibiotic translocation across bacterial membranes and bacterial susceptibility, concepts & methods ____ 27

Keynotes ____ *29*

1.1 Zoonoses, emerging and re-emerging diseases: virology, bacteriology, mycology and parasitology __ **29**

SARS-CoV2 a threat across the human-animal-environment dimensions: how the prediction, prevention, detection and response to emerging infectious diseases needs a new technological boost ____ 29

1.2. Microbiome-in-health-and-disease-microbial-diversity-and-host-microbes-interactions ____ **31**

Pathogens and the microbiome: antibiotics at the crossroad ____ 31

1.3 Microbiology & Biotechnology in COVID-19: new approaches for new diseases ____ **32**

Signatures in SARS-CoV-2 spike protein conferring escape to neutralizing antibodies ____ 32

1.4 & 1.6 Biopharmaceuticals & Vaccines: design, analytical methods and bioprocessing opportunities _ **33**

Two-Component Nanoparticle Vaccine Displaying Glycosylated Spike S1 Domain Induces Neutralizing Antibody Response against SARS-CoV-2 Variants ____ 33

RNA as biopharmaceuticals – the challenges behind bioprocessing ____ 34

1.5 Antimicrobial Resistance in One Health: the silent pandemics ____ **35**

Antimicrobial resistance in One Health: the silent pandemic on human health ____ 35

Antimicrobial resistance in One Health: the silent pandemic on the animal and environmental settings ____ 36

1.7 Molecular microbiology in the NGS era: early detection and identification of pathogens and its dispersion and evolution ____ **37**

How next-generation sequencing (NGS) is helping to preview, prevent, and manage public health threats ____ 37

2.1 Biotechnology and Sustainability I ____ **39**

Biotechnology in circular economy & bioeconomy: Bioengineering and microbiology for sustainable development: the case of bioethanol ____ 39

2.2 Biotechnology and Sustainability II ____ **41**

Hybrid High Throughput Process Development for Biologics Production ____ 41

2.3 Biotechnology and Sustainablility III ____ **43**

New phototrophic factories for nutrient recovery and polyhydroxyalkanoates production 43

3.1 Microbial physiology and biochemistry: microbial activity in the context of environmental changes 45

A novel capsular polysaccharide from *Shewanella vesiculosa* HM13 with adhesive properties 45

3.2 Biotechnology and environmental microbiology: from psychrophiles to extremophiles 46

Diversity, secondary metabolites and biotechnological potential of marine-derived actinomycetes from the coasts of Continental Portugal and the Macaronesia archipelagos 46

3.3 Microbiological collections: resources for a sustainable present and future 48

Creating novel opportunities for using microbial resources 48

3.4 Soil health, food security and food safety 50

Fresh produce bioprotection and biopreservation 50

3.5 Biotech4food – nutrigenomics, personalized nutrition and food production 51

Environment, gene and personalized nutrition 51

4.1 Teaching and Communicating in Science 52

The International Microbiology Literacy Initiative 52

4.2 COST sessions rooms 54

COST (European Cooperation in Science and Technology): Funding networking opportunities 54

5.1 Genome Editing for therapy, biotechnological & food use 55

Pedro Fevereiro - TBA 55

5.2 Synthetic & Systems biology: experimental, theoretical and computational approaches for the analysis of micro and biological systems 56

Synthetic biology approaches to engineer polyphenols microbial cell factories 56

5.3 New approaches for disease control and treatment 57

Pulmonary Phage Therapy: from proof of concept to pre-clinical assessment 57

Targeting viral ribonucleases from SARS-CoV-2 to combat COVID-19 58

5.4 Digital Data, Big Data & AI in Microbiotech 59

In data speramus – How do deliver against the believe in the power of machine learning in biotechnology 59

Oral Presentations* *60

1.1 Zoonoses, emerging and re-emerging diseases: virology, bacteriology, mycology and parasitology 60

O.167. Live cell biosensors for detection and quantification of viral pathogens 60

O.257. The role of Toll Like Receptors on the innate immune response against *Mycobacterium ulcerans infection* 61

O.361. A new high-performance method to detect, identify, and sort metabolically active cells of environmental *Mycobacterium bovis* 63

1.2 Microbiome in Health & Disease: microbial diversity and host-microbes interactions 65

O.1. Multiple acyl-CoA dehydrogenase deficiency kills *Mycobacterium tuberculosis* in vitro and during infection 65

O.24. Pneumococcal colonization, smoking status and contact with children influence the upper respiratory tract microbiota of healthy adults 66

O.67. A new *Legionella pneumophila* effector displaying strain-specific nucleotropism 68

O.110. Identification, phenotypic characterization, and selection of gilthead seabream (*Sparus aurata*) associated bacteria for application as putative probiotics in fish larviculture 69

O.139. Efficient encapsulation of the newly synthesized cell wall protects *Streptococcus pneumoniae* from peptidoglycan hydrolases and host defenses 70

O.157. Virulence gene repression promotes *Listeria monocytogenes* systemic infection 71

O.189. *Burkholderia cepacia* complex silencing proteins as mediators of horizontally transferred genes expression during infection of host cells 72

O.280. Characterization of growth and quorum sensing responses in *Barnesiella* and *Muribaculum* gut microbiota members 74

1.3 Microbiology & Biotechnology in COVID-19: new approaches for new diseases 76
O.6. SARS-CoV-2 membrane protein: from genomic data to structural new insights 76
O.272. Wastewater monitoring of SARS-CoV-2 RNA in Porto, Portugal: temporal variations during the COVID-19 pandemic 78
O.406. SYBR Green-based RT-PCR tests for rapid, sensitive and inexpensive detection of SARS-CoV-2 80

1.4 & 1.6 - Biopharmaceuticals & Vaccines: design, analytical methods and bioprocessing opportunities 81
O.49. Development of recombinant vaccines against Vibrio spp. using an outer membrane channel as target 81
O.92. Cyanobacterial extracellular vesicles as novel molecular-display platforms targeting fish-related applications 83
O.296. A cyanobacterial extracellular carbohydrate polymer with strong antitumor activity 85
O.388. Biocompatible excipients to improve the stability of immunoglobulin Y (IgY) antibodies 87
O.412. Cell line engineering for stable expression of cytotoxic envelope glycoproteins to enable continuous lentiviral vector production 89
O.439. Minicircle-derived RNA interference as a novel gene-based anti-angiogenic therapy 90

1.5 Antimicrobial Resistance in One Health: the silent pandemics 92
O.104. Report of *bla*$_{NDM-5}$ in the Portuguese nosocomial environment: is one integron all it takes? 92
O.199. A new evolution pathway leading to azole resistance in *Candida glabrata* 94
O.213. The cell and molecular biology of carbapenem resistance in *Clostridioides difficile*. 95
O.224. From farm to fork: studying the diversity and persistence of colistin resistant *Klebsiella pneumoniae* in colistin-free chicken farms 96
O.347. Carbapenem-resistant *Klebsiella pneumoniae* can survive in surface water for at least one week 98
O.421. Analysis of vancomycin-resistant *Enterococcus faecium* causing hospital infections in Porto, Portugal, over the last decade 100

1.7 Molecular microbiology in the NGS era: early detection and identification of pathogens and its dispersion and evolution 102
O.25. Contribution of Next-Generation Sequencing to Fish Virology: virome characterization of Atlantic horse mackerels and gilthead seabreams farmed/captured along Portugal 102
O.329. Insights into the evolutionary forces shaping the pan-genome architecture of strictly clonal *Mycobacterium bovis* 104
O.444. Molecular epidemiology of Zika virus: a worldwide characterization 106

2.1 Biotechnology and Sustainability I 108
O.97. The riboflavin overproducing yeast *Candida membranifaciens* IST 626: from isolation and production optimization to genome analysis for future development of superior strains 108
O.160. Promising Genetic Determinants Of Methanol Tolerance For Yeast Robustness Engineering For Biorefineries 110
O.205. Optimizing chemical digestion approaches for polyhydroxyalkanoates extraction from biomass produced with paper-mill wastewater 112
O.233. Low-cost and eco-friendly downstream processes for single-step purification and immobilization of recombinant proteins 113
O.235. Multi-feedstock approach for ethanol production using cell surface engineered *Saccharomyces cerevisiae* 115
O.247. Impact of a DedA family protein in Indium Bioaccumulation by 117
a *Rhodanobacter* sp. B2A1Ga4 strain 117
O.264. Engineering Ato1 transporter from *Saccharomyces cerevisiae* enables higher range of carboxylic acids uptake 118
O.405. Marine-derived actinobacteria produce bioplastics while degrading (micro)plastics? 119

2.2 Biotechnology and Sustainablility II 121
O.*5. Zymomonas mobilis*: a promising microorganism for prebiotic production 121
O.38. Camelina sativa meal hydrolysate as sustainable biomass for the production of carotenoids by Rhodosporidium toruloides 122
O.57. Biological saline produced water treatment, a sustainable process towards lipids production 123
O.120. Microalgae granular systems feasible for the treatment of marine aquaculture streams containing florfenicol antibiotic 125

O.158. Biochemical characterization of the inner membrane cytochrome CbcL: a gate for extracellular electron transfer in Geobacter *sulfurreducens* 126
O.246. Engineering a native *Kluyveromyces marxianus* transporter to reprogramme the balance between hexose and pentose transport 127
O.321. Unveiling the Phytochemical Nature of Acorns: The Relevance of Dehusking 128
O.324. Anaerobic biological removal of pharmaceuticals: impact of these micropollutants towards different microbial groups in anaerobic communities 129

2.3 Biotechnology and Sustainablility III 130
O.223. Lyophilized bacterial agents for bioremediation of hydrocarbons in seawater: tackling a port oil spill accident 130
O.226. The Curious Case of Microorganisms and Moonmilk: A comparative study of three non-ornated caves from the Vézère Valley (Dordogne, France) 132
O.270. GreenRehab: A rehabilitation system for burned soils based on the inoculation of native cyanobacteria and microalgae 134
O.338. Facultative anaerobic bacteria: key players in syntrophic fatty acids degradation under microaerophilic conditions 136
O.366. Efficient ammonium removal from marine aquaculture wastewater with microalgal-bacterial granular sludge technology 138
O.400. Optimization of phosphate accumulating bacterial strains for phosphorous uptake in residual waters 139
O.402. Dynamic columns to assess the impact of nutrients, bioaugmentation and negative pressure in bioleaching of mining residues of Panasqueira mine 141
O.407. Interaction of *Mesorhizobium quingshengii* J19 with high concentrations of yttrium 143

3.1 Microbial physiology and biochemistry: microbial activity in the context of environmental changes 145
O.113. *Erwinia* regulates expression of host specific virulence factors via quorum sensing 145
O.225. Effect of low pH in the denitrification pathway and nitrous oxide reductase 147
O.355. Cyanobacterial extracellular vesicles: biological functions and biotechnological applications 148

3.2 Biotechnology and environmental microbiology: from psychrophiles to extremophiles 150
O.19. Biodegradation potential of paracetamol by consortia and bacterial isolates recovered from marine organisms 150
O.30. Genetic characterization of viral structural-protein coding-sequences of Human polyomaviruses present in wastewater and environmental samples Lisbon 151
O.87. Exploring deep-sea-Actinobacteria chemical diversity by using the OSMAC approach 153
O.161. Light-emitting diodes effect on *Aspergillus* species in filtered surface water matrices: DNA damage, proteome response and potential reactivation 154
O.194. Bioprospecting Actinobacteria from poorly surveyed deep-sea habitats of the Azores and Madeira archipelagos 155
O.293. Impact of microbiological contamination on dark stains in granite and mural painting of religious buildings in Northern Portugal 157
O.386. Comparative genomics unveils fundamental traits on the biology and physiology of the bio-flavouring species of the *Saccharomycodeacea* family *Hanseniaspora guilliermondii* and *Saccharomycodes ludwigii* 159
O.393. Occurrence and inactivation of antibiotic-resistant bacteria present in surface water 160

3.3 Microbiological collections: resources for a sustainable present and future 161
O.79. Marine host-associated bacteria show versatile secondary metabolite biosynthesis capacities and antimicrobial activities 161
O.323. The BACA collection as a resource for cyanobacteria diversity assessment of the Azores using a polyphasic approach 164
O.331. A Georeferenced Library of Native Microorganisms for Bioremediation of Oil Spills 166

3.4 Soil health, food security and food safety 168
O.174. Fresh cheese shelf-life extension at variable room temperature comparatively to refrigeration 168
O.178. Multilocus DNA metabarcoding of complex mixtures containing members of the Boraginaceae family for food safety and quality assurance 170

O.403. Surveillance study of *Staphylococcus aureus* in raw milk from Northern Portugal: enterotoxins and resistance genetic profiles 172

3.5 Biotech4food – nutrigenomics, personalized nutrition and food production 174

O.426. A sustainable alternative for cheese production – a synthetic biology approach for chymosin production using recombinant Lactic Acid Bacteria 174

O.438. Prevalence and control of Shiga toxin-producing E. coli: from diversity in dairy cattle to phage therapy 176

O.451. Perspectives on the development of CLA/CLNA-enriched milk through *in situ* microbial production 177

4.1 Teaching and Communicating in Science 179

O. A picture is worth a thousand words: Science Communication in Microbiology 179

O.94. The International Microorganism Day: an initiative from Portugal to the World 180

4.2 COST sessions rooms 181

O.417. The COST Action EuroMicropH: Understanding and exploiting the impacts of low pH on micro-organisms 181

O.453. YEAST4BIO COST Action: Unraveling how non-conventional yeasts can be successfully implemented in biotechnological industries for bioproducts production 182

5.1 Genome Editing for therapy, biotechnological & food use 183

O.232. New genome-editing tools for *Ashbya gossypii* 183

O.*255. Tools provided by RNAseq for the improvement of the entomopathogenic nematode H. bacteriophora* 185

O.434. Targeted removal of the *nth* nuclease gene from *Lactococcus lactis* subsp. *lactis* LMG19460 and its effects on plasmid DNA yield 186

5.2. Synthetic & Systems biology: experimental, theoretical and computational approaches for the analysis of micro and biological systems 187

O.4. A study of native tandem promoters of *E. coli* and their use in synthetic circuits 187

O.78. A computational approach to finding new drug targets for pathogenic *Candida* species 188

O.95. The N.C.Yeastract and CommunityYeastract databases and tools: studying transcriptional regulation in non-conventional yeasts 189

O.252. Study of the antibacterial mechanism of cyprosin extract against *Helicobacter pylori* cells using mid-infrared spectroscopy and chemometrics methods 191

O.396. Prospecting new-to-nature pathways to implement microbial production of levulinic acid 193

5.3 New approaches for disease control and treatment 195

O.209. Mycobacteriophage Ms6 LysB: a lipolytic lysis enzyme with Peptidoglycan Binding Affinity 195

O.210. IR Bactyping, the next cornerstone for *Klebsiella pneumoniae* strain typing towards real-time infection control 197

O.248. A genome-wide level perspective on the microevolutionary trajectory by endemic *Mycobacterium tuberculosis* strains in Portugal: impact for phenotypic resistance levels and therapeutic efficacy 199

O.275. Rifabutin liposomes: an effective drug delivery therapy for biofilm associated *S. aureus* infections 201

O.394. Targeting diabetic foot infection through a novel biomaterial-based topical therapeutic approach 203

O.432. *Helicobacter pylori* prophages: screening, detection, induction and potential therapeutic use 205

5.4 Digital Data, Big Data & AI in Microbiotech 207

O.85. Learning from fluorescence: online multiparameter monitoring of a microalgae culture 207

O.188. eHooke: a framework for automated image analysis of *Staphylococcus aureus* based on cell cycle progression 209

Poster Presentations 211

1.1 Zoonoses, emerging and re-emerging diseases: virology, bacteriology, mycology and parasitology 211

28. Biosafety measures in freshwater fish ex situ breeding programs - a preliminary approach 211

29. Influence of climate change on growth, biofilm production and antimicrobial resistance profiles in *Aeromonas* spp. 213

45. Medium matters: influence of different mediums and atmospheres on the haemolytic profiles of canine oral enterococci 214

53. Evaluation of *Aliarcobacter butzleri* response to bile salts 215

55. Effect of the application of organic acids on the spoilage of bovine viscera for human consumption _____216
56. Evaluation of citric and lactic acid application in the behavior of *Listeria monocytogenes* on pig carcasses samples _____218
81. Presence of viable pathogenic leptospires in environmental samples from three districts of mainland Portugal: a pilot study. _____220
109. Canine and feline haemoparasites – brief report of the veterinary hospital. _____221
153. Tracking Tick-borne rickettsiae in a national park in Portugal _____222
185. Characterization of Hazara virus infection in *Hyalomma lusitanicum* tick cell line. _____224
193. Microbicidal activity of macrophages exposed to pathogenic spirochetes *Borrelia garinii* and *B. lusitaniae* species_____225
195. Deciphering the virulence potential of human isolates of *Aliarcobacter butzleri* _____227
198. Optimization of a Real-Time PCR protocol using primers based on the *lipL32* gene for *Leptospira* DNA detection in biological and environmental samples _____228
222. The *in-vitro* antidermatophytic activity of Withania Chevalieri an endemic plant from Cape Verde_____229
281. The role of wild animals and associated ticks in *Coxiella burnetii* natural cycle _____231
376. Proposing a new *Shewanella* species causing human infections _____233
401. Development of a standard operation procedure (SOP) for the polyphasic identification of clinically relevant species_____234
452. Development of new diagnostic tools for the detection of *Toxoplasma gondii.*_____236

1.2 Microbiome in Health & Disease: microbial diversity and host-microbes interactions _____237

10. Evaluation of methicillin-resistant Staphylococcus aureus carriage in the elderly in Portugal using selective enrichment followed by qPCR _____237
11. Induction of multinucleation in infected host cells by a *Chlamydia trachomatis* inclusion membrane protein _238
12. Intra-species interactions in pneumococcal biofilms _____239
65. Functional and comparative metagenomics of viral communities in healthy and diseased octocoral tissue and seawater _____240
86. The *Roseibium album (Labrenzia alba)* pangenome reveals multiple symbiosis factors likely underpinning host-microbe relationships in the marine benthos _____243
88. Phylogenetic and functional analysis of orthologs of CteG, a *Chlamydia trachomatis* effector protein _____246
89. Bacterial Vaginosis multi-species biofilms: can standard quantification methods accurately quantify *in vitro* biofilms? _____247
93. Identification of Clostridioides difficile biofilm matrix proteins _____248
99. IncL is a novel *Chlamydia trachomatis* protein interacting with host cell lipid droplets and eukaryotic 14-3-3 proteins_____249
101. Study of the interaction between vaginal and intestinal lactobacilli, *Candida albicans* and *Candida glabrata*_250
103. Insights into the adaptation of *S. epidermidis* biofilms to effectors of the immune system_____251
122. Characterization of single- and multi-species Bacterial Vaginosis (BV)-associated biofilms in an ex vivo 3D human vaginal epithelium model _____252
124. The role of the gene *codY* in *S. epidermidis* biofilm formation_____253
140. The putative toxin-antitoxin *mazEF* gene cluster is not involved in cell death in *S. Epidermidis* _____254
148. Identification of amino acid residues important for the subcellular localization of the *Chlamydia trachomatis* effector CteG in host cells _____255
150. Lytic exit of *Chlamydia* trachomatis from host cells is mediated by the CteG effector protein _____256
180. Evaluation of mannans from *Saccharomyces cerevisiae* as potential human microbiota modulators_____257
190. Molecular players involved in the transition of free-cells to multicellular aggregates in *Burkholderia multivorans* _____258
191. Peptide-rich extracts from spent yeast as potential microbiota modulators _____260
197. Oral poliomyelitis revaccination is associated with changes in gut and upper respiratory microbiomes of infants _____261
204. Nanopore sequencing approaches to profile the gut microbiota of mice infants exposed to alcohol in utero_262
208. Staphylococcus epidermidis molecular responses to pH changes during human infection – a multiomics approach_____264
229. Comparative metabolomic study indicates a metabolic re-route of a pathogenic *Staphylococcus epidermidis* strain at blood pH_____266

231. Impact of a pulse-based vegetarian lunch meal on the modulation of gut bacterial sub-populations 268
268. Role of ScwdABC system of *Staphylococcus aureus* in biofilm formation and infection 270
286. The microbiome(s) of Senegalese sole fed with different diets 272
294. Mass Spectrometry – Based proteomic and metabolomic profiling of serum samples for discovery and validation of TB diagnostic biomarker 274
295. Promoting a healthy microbiome with *Lactobacillus* isolated from human milk 276
300. Uncovering the commensalism vs pathogenicity in Staphylococcus Epidermidis – A combined genomic/proteomic approach 277
303. Two novel *Gardnerella* species isolated from urine of women 279
320. Chronic vulvovaginal Candida spp clinical isolates are more resistant to phagocytosis in in-vitro models of infection 281
372. Do all prebiotics have the same impact on my gut microbiota? A case study using an *in vitro* gastrointestinal model to assess functional oligosaccharides added to milk 282
375. Identification of new players of lysozyme resistance in *Staphylococcus aureus* 283
383. Peptidoglycan amidation impact on biofilm formation - role of eDNA and Atl- 285
389. Establishment of the MurT-GatD complex as a new virulence factor 286
427. The genetic basis of bacterial adaptation to a complex environment and its consequences on *Caenorhabditis elegans* ability to respond to environmental and life-history changes. 287
446. Characterization of small noncoding RNAs expressed by *Burkholderia cenocepacia* when infecting *Caenorhabditis elegans* 288
465. Probiotic adhesion to skin keratinocytes and underlying mechanisms 290

1.3 Microbiology & Biotechnology in COVID-19: new approaches for new diseases 291

14. Preventing COVID-19 outbreaks through active screening of civil servants - A partnership between local government, a primary-care center and a research institute 291
145. SARS-CoV-2 contamination potential in environmental and wastewaters in the Algarve region, Southern Portugal 293
165. Repositioning drugs with potential activity against SARS-CoV-2 infection 295
263. Evaluation of minimum inhibitory concentrations of plants extracts against several bacterial pathogens 297
278. Experimental approach to detect SARS-CoV-2 in aerosol suspensions in COVID19 patients domiciliary setting 298
311. UVC radiation and Ozone as disinfection methods against a viral surrogate of SARS-CoV-2 300
315. Antioxidant activity, phenolic profile, cytotoxicity and genotoxicity of plant extracts 302
322. Ozone and UVC radiation as disinfection strategies of textile substrates 303
341. Predominant phenolic compounds in Mountain plants with possible antiviral potential against SARS-CoV2 304
449. Assessing the microbiological efficacy of three scalable decontamination methods as a strategy to address the need for respiratory protective devices during a pandemic 306

1.4 & 1.6 Biopharmaceuticals & Vaccines: design, analytical methods and bioprocessing opportunities 308

13. An alternative way to purify recombinant E6 protein from Escherichia coli cells: a target for cervical cancer 308
27. QAS-hydrogels as a promising microbicide against sexually and perinatal transmitted infections 309
152. Surfomics reveal a new target for the development of immunotherapies to tackle *Burkholderia cenocepacia* infections 310
302. A chromatographic strategy for the purification of small heat shock protein nanocages 311
364. Recombinant CBM-fusion technology towards production of novel cellulose-based materials with biomedical interest 312
379. Bacterial cellulose for burn wounds dressings 314
385. Essential Oils of *Mentha pulegium*, *Mentha spicata* and *Calamintha nepeta*, from Alentejo: Antimicrobial Activity against Biodeteriogenic Microorganisms and Immobilization in β-cyclodextrin Complexes 315
392. Development of antimicrobial polymeric surfaces 317
413. Lentiviral vector components expression levels and stability: impact on constitutive producer cell yields and vector quality 319
422. Establishing new cell platforms for scalable lentiviral vector production 320
424. Characterization of a novel ferulic acid pathway in Lactococcus lactis 321

1.5 Antimicrobial Resistance in One Health: the silent pandemics 323

16. Heteromeric phage endolysins - not just an eccentricity of few 323

18. Determinants of bacterial tolerance to endolysin-based enzybiotics 325
26. Antibiotic Resistance Mechanisms in Environmental and Pathogenic Carbapenem Resistant Bacteria from a Portuguese Wastewater Treatment Plant 326
35. A novel target in TB-therapy: the *N*-glycolylation of mycobacterial peptidoglycan contributes to antibiotic resistance and intracellular survival 328
36. Finding Key Genomic Markers of Beta-lactam Susceptibility in Clinical Isolates of *Mycobacterium tuberculosis* 329
43. Ascertaining mycobacterial inducible resistance 331
to peptidoglycan synthesis inhibitors 331
46. Antimicrobial resistance and virulence profiles of Enterobacteriaceae isolated from two-finger and three-finger sloths (*Choloepus hoffmanni* and *Bradypus variegatus*) of Costa Rica 332
52. Evaluation of efflux activity in *Staphylococcus pseudintermedius* and its contribution for biocide decreased susceptibility 333
54. Biofilm production by *Staphylococcus pseudintermedius* associated with animal pyoderma 335
70. Unravelling the drivers of antimicrobial resistance in *Staphylococcus aureus* from wildlife 337
71. In vitro interactions during bacterial vaginosis development demonstrate that multi-species biofilms have enhanced antimicrobial tolerance 338
82. Insights into pESI-like megaplasmid of *Salmonella* Infantis ST32 spreading in the poultry industry 339
83. Overview on antimicrobial resistance of S*almonella* enteritidis ST11 in the poultry industry, Portugal 2014-2020 340
84. Overview on the resistance to critically important antibiotics (CIA) from food-producing animals and food 341
90. Antibacterial and antiviral activity of Preyssler polyoxotungstate P_5W_{30} 342
107. Bacterial urinary tract infections in pets: diversity *vs* antibiotic resistance and its significance for public health. 343
126. Freshwater cyanobacteria: a new player in the One Health puzzle 344
206. Detection of β-lactamases and the simultaneous presence of increased efflux activity in *Enterobacteriaceae* using a 96-well microplate method 346
212. The genetic circuitry controlling production of a MecA-like penicillin binding protein required for carbapenem resistance in *Clostridioides difficile* 348
214. Bacterial Peroxidases from Pathogenic Bacteria 349
221. Twort CHAP domain secondary binding site specifically targets the peptide component of *Staphylococcus aureus* peptidoglycan 350
228. The dual binding mode of Twort SH3b domain to *Staphylococcus aureus* peptidoglycan 351
236. Evaluation of the genetics underlying a putative acquisition of antimicrobial resistance to novel alkylaminophenols 353
237. Are quaternary ammonium surfactants a good prophylactic option against *Streptococcus agalactiae* vertical transmission? 355
242. The pig production chain in Portugal is a key reservoir of antibiotic-resistant and pathogenic Enterobacteriaceae 356
243. Assessing the role of phenotypic heterogeneity on *Staphylococcus aureus* tolerance to β-lactams 358
244. Screening of stress effect on the survival of clinical and environmental antibiotic resistant *Escherichia coli* and *Klebsiella pneumoniae* isolates 359
245. Conjugation of imidazolium-based ionic liquids to antimicrobial peptides: effects on antimicrobial activity and cytotoxicity 361
249. Virulence traits of *Staphylococcus aureus* associated with skin and soft tissue infections in humans and animals 362
250. Co-carriage of clinically important antimicrobial resistance genes by healthy companion animals and their human household members 364
259. Detoxification of toxic intermediates produced by oxygen reduction in human pathogens 366
266. Evaluation of IR Biotyper for long-term surveillance of carbapenemase-producing *Klebsiella pneumoniae* clinical isolates 368
298. A hygiene and monitorization program for small animal veterinary practices – A Pilot-study 370
299. ESBL and AmpC producing Enterobacterales in urban waters of Douro River in Portugal – 372
Is the environment a mirror of community intestinal colonization? 372

301. Characterization of bactericidal activity of new NHC carbenes and their Cu(I) and Ag(I) complexes against pathogenic bacteria 374
325. Optimized Red Nile semi-automated fluorometric method shows competition between substrates of the AcrAB-TolC efflux pump of *Escherichia coli* 376
326. Measuring efflux activity in *Escherichia coli* using Hoechst 33258, a bis-benzimidazole derivative 378
332. The role of the pork production chain as a reservoir and transmission route of Enterobacteriaceae resistant to last resort antibiotics 380
344. Using genomics to uncover the role of SMR efflux pumps to *Acinetobacter baumannii* drug resistance 382
349. Comparative genomics insights into clinical or environmental methicillin-resistant *Staphylococcus aureus* 384
359. Exploring *Enterococcus* susceptibility to co-occurring stresses in the poultry meat production chain: antibiotics, copper, acidic pH and peracetic acid 386
365. Molecular characterization of *Staphylococcus pseudintermedius* associated with skin and soft tissue infections in pets, Portugal 388
367. Exotic Pets as a reservoir of MultiDrug Resistant priority pathogens with special focus on Enterococcus faecalis (2017-2019 Toulouse, France) 390
369. Pan-genome and pan-resistome analysis of blaVIM-2+ or bla_{NDM-1}^{+} carbapenem resistant *Pseudomonas aeruginosa* 392
370. Quaternary Ammonium Compounds' activity and occurrence of tolerance associated genes among *Enterococcus faecalis* and *Enterococcus faecium* from diverse origins and timespans 394
374. Antibacterial and synergetic activity of essential oils of *Thymus capitellatus*, *Origanum virens* and *Origanum macrostachyum* of Alentejo (Portugal) 396
377. Assessment of MICs for *Mycobacterium tuberculosis* complex clinical strains using the EUCAST reference method 398
381. Emergence of staphylococcal non-wild-type populations to biocides in a One Health perspective: are there reasons for concern? 400
387. New CRISPRi System to Inhibit Transcription of Essential Genes in *Staphylococcus aureus* 402
397. Exploring environmental sources and transmission routes of multidrug-resistant *Escherichia coli* in Lettuce Greenhouses 403
404. Antimicrobial resistance and molecular typing of Staphylococcus aureus causing bacteraemia in children aged less than 5 years in Southern Mozambique, 2001-2019 405
416. Fluoroquinolone resistance and associated mechanisms 407
in *Staphylococcus pseudintermedius* 407
420. *Candida glabrata* response to the antifungal fluconazole is partially coordinated by the transcription factor Zap1 409
435. Microemulsions based on deep eutectic solvents to tackle resistant ocular infections 410
450. Raw pet food: new route for bacterial zoonotic health risks spread in Europe 412
455. Irrigation Water and Soil as sources of Pathogenic and Antibiotic Resistant Bacteria in Portuguese tomato greenhouses 414
459. Antimicrobial screening of *Lavandula* spp. hydrodistillation products against potentially pathogenic bacteria 416

1.7 Molecular microbiology in the NGS era: early detection and identification of pathogens and its dispersion and evolution 418

9. Pneumococcal carriage among Portuguese children after the introduction of the 13-valent pneumococcal conjugate vaccine (PCV13) in the National Immunization Plan 418
112. Vancomycin resistant *Enterococcus faecium* causing infection in portuguese hospitals: predominance of the ST17-*vanA* lineage 420
121. Pretreatment of biological samples using three-phase partitioning systems: a tool to enhance early diagnosis 422
170. Genome analysis of *Diaporthe amygdali* and *D. eres*: unraveling adaptation for plant cell wall degradation and its pathogenicity potential 423
200. Unveiling the genomic basis for differential biofilm formation capacity in *Candida glabrata* clinical isolates 425
423. Genes contributing to high-level oxacillin resistance among MRSA isolates carrying different methicillin genetic determinants 426

2.1 Biotechnology and Sustainablility I 427

7. Assessing predatory activity of native Portuguese filamentous fungi against coccidia from peacocks (*Pavo cristatus*) – *in vitro* preliminary results 427
40. Improving the production of polymers using biocatalysis 428
41. Design of an integrated platform based on aqueous biphasic systems for the enzymatic production of polydopamine and biocatalyst reuse 430
58. Obtention of PHB from cocoa shell wastes by fermentation 432
74. Bacterial Cellulose: From Biotechnology to Bio-Economy 433
76. Sugarcane-derived biogenic silica particles as a topical delivery system for retinoids 434
96. Enhancing anaerobic digestion of lignocellulose biomass using a thermophilic microbial consortium pretreatment 435
105. Aerobic granular sludge, a feasible technology for the treatment and recirculation of trout aquaculture water streams 436
115. Production of 3D biocomposite scaffolds based on polyhydroxyalkanoates (PHAs) and FucoPol 437
117. Coupling microbial engineering with structural biology: a new foundation to solve *Geobacter*'s extracellular electron transfer paradigm 439
130. Assessment of bioethanol production from *Eucalyptus globulus* bark kraft pulp 441
143. Characterization of the thermostable bacterial biosurfactant produced by *Burkholderia thailandensis* 442
155. Sugarcane as a sustainable source of biologically active carboxymethyl cellulose 443
156. Sugarcane bagasse cello-oligosaccharides as prebiotic agents 444
171. Integrated genomic and metabolomic analysis of the marine fungus *Emericellopsis cladophorae*: insights into saltwater adaptability mechanisms and its biosynthetic potential 445
175. Functional screening for the detection of β-glucosidase activity in a metagenomic library obtained from a compost sample 446
176. Engineering redox proteins for optimal bioenergy production 448
184. Redirecting the reducing power in *Starmerella bombicola* towards production of compounds with industrial interest 449
196. Development of GABA-enriched fermented beverage based on sweet whey 450
211. Microwave-assisted extraction strategies for biologically active molecules from *Tetraselmis chuii* and *Chlorella vulgaris* 451
216. Phenolic compound modulation in yeast fed-batch fermentation using sugarcane syrup as feedstock 452
238. Microalgal biomass production in a raceway system using meat processing water as feedstock 454
239. Yeast platform for the production of 5-hydroxymethylfurfural-derivatives: *Saccharomyces cerevisiae as a whole cell biocatalyst* 455
241. Project BIOREM: Bioremediation of hydrocarbon pollutants by autochthonous microorganisms in aquatic environment 456
251. Overexpression of bacterial metallothioneins increases 458
the Gallium and Indium recovery 458
254. Metal biosorption by bacterial biopolymers 460
261. Comparative genomics of bacterial mine isolates to unravel metabolic features linked to gallium bioleaching ability 462
267. The importance of QrcABCD-QmoABC redox-loop for H_2/formate-sulfate respiration in sulfate reducers 464
269. Effect of extraction methods on antioxidant activities of *Tetraselmis chuii* 465
274. Improving *Desulfovibrio vulgaris* Hildenborough [NiFeSe] Hydrogenase Resistance to Oxidative Inactivation 466
277. Recombinant expression and insecticidal activity of one ShK domain of the entomopathogenic nematode *Steinernema carpocapsae* in fusion with –DsbC 467
282. Application of a fungal extract with laccase activity to improve the enzymatic hydrolysis of eucalyptus bark residues 468
283. Development of an electrotransformation protocol for the novel acetogen Acebotacterium wieringae strain JM 470
284. Targeting Aerobic Granular Sludge Microbiome Salt Adaptation 472
285. Exploring the potential of primary sludges from paper mills for the production of value-added compounds 473
291. Kudzu starch structure, physical, and mechanical properties, a starch with potential application on cultural heritage conservation 475
292. Soil microbiota benefits from phytoremediation coupled to metal-resistant rhizobacteria 477

297. Application of bacteriocin-producer in the reduction of cheese maturation time 478
304. Over-expression of AMPs in industrial *Saccharomyces cerevisiae* strains as a biocontrol approach for fuel ethanol fermentations: cloning strategy and characterization 479
305. Antibacterial biocomposites of a genetically engineered protein polymer incorporating essential oil from *Mentha piperita* 481
310. Wine industry residues for biotechnological production of xylitol 483
313. Impact of gastrointestinal digestion on the biological activities of new functional cereal-based granules based on by-products from the food industry 484
314. Anaerobic granular sludge as biocatalyst for CH_4 production at moderate H_2/CO_2 pressures 486
316. Unraveling the Role of Dehulling on Acorn's Nutritional Composition 488
319. Production of recombinant bioactive antimicrobial peptides using a thermoresponsive fusion tag 489
334. Development of efficient industrial xylose-fermenting *Saccharomyces cerevisiae* strains using genes from native xylose-utilizing yeasts 491
335. Xylulokinases from two native xylose-fermenting yeasts improve xylose conversion in recombinant *Saccharomyces cerevisiae* 492
351. Antimicrobial potential of formulations, incorporating spent yeast derived from synthetic biotechnology, against *Pseudomonas spp.* 493
353. Valorization of biotechnology derived spent yeast as potential ruminant feed additive 495
356. Growth of *Saccharomyces Cerevisiae*: Screening the Best Conditions 496
357. Biosolvents, ionic liquids, or eutectic solvents? In the search of best solvents for the extraction of carotenoids from yeast cells 497
362. Resveratrol production by recombinant robust yeast strains for valorisation of wine waste 499
368. Lignin-based adhesives as a sustainable strategy for conservation of cultural goods 501
371. High value tellurium nanoparticle formation by *Paenibacillus pabuli* 503
395. Dye decolorization by yeasts: towards an innovative solution for textile effluents 505
409. Optimization of hemicellulose extraction from sugarcane straw by autohydrolysis 507
410. Screening of antimicrobial activity in fractionated synthetic biology industry waste streams 508
411. Synthetic biology byproducts valorization into fish-feed prebiotic ingredients 510
425. Bacterial Biodegradable Polymers in a Circular and Sustainable Bioeconomy 511
428. Microalgae-bacterial granular sludge for the treatment of low carbon and nutrient loaded effluents 513
430. Pre-treatment of sugarcane straw and bagasse with ionic liquid for the production of cellulosic ethanol and lignin 515
431. Bacterial cellulose production from terephthalic acid and ethylene glycol by *Komagataeibacter xylinus* DSM 2004 and 46604 517
437. Genome Sequence and Annotation of *Lactococcus lactis* Strain LMG 19460 and Novel Strains IST-LL01 and IST-LL02 518
440. Freetilizer technology- a new path for the valorisation of horticultural residues 520
442. Process intensification for the recovery of intracellular carotenoids from *Rhodotorula glutinis* yeast 521
448. Potential of sugarcane straw extracts as preservatives for the cosmetic industry 523
454. Overgrowth control of potentially hazardous bacteria in ozonated wastewater through competition: microbiome analysis 524
457. Sugarcane bagasse as source of bioactive lignin: influence of pretreatment on the antioxidant and antibacterial activities 526
460. Coatings of chitosan and chitosan with essential oil of *L. stoechas* subsp. *luisieri* for the control of spoilage microorganisms in post-harvest conservation of *Prunus avium* fruits 528
464. The effect of calcium concentration on culture medium for the production of biosandstones 530

2.2 Biotechnology and Sustainability II 531

102. Sustainable lysis of *Bacillus subtilis* biomass to recover the biopharmaceutical L-asparaginase 531
230. Ionic liquids as promising solvents for biocatalysis 533

2.3 Biotechnology and Sustainablility III 534

192. Mining seaweed-associated Actinobacteria for biotechnologically-relevant compound discovery 534
215. Membrane transporters in the bioproduction of organic acids: state of the art and future perspectives for industrial applications 536

218. Expanding the knowledge on the skillful yeast *Cyberlindnera jadinii* 537
240. Diversity and hydrocarbon-degrading potential of deep-sea microbial community from the Mid-Atlantic Ridge, south of the Azores (North Atlantic Ocean) 538
258. *Streptomyces* spp. rRNA-FISH probe to apply in cultural heritage materials: *in silico* design and experimental evaluation of specificity and performance 540
262. Uncovering novel *Cyberlindnera jadinii* carboxylate transporters for the improvement of microbial cell factories 542
279. Unraveling the diversity and biotechnological potential of ascidian-associated Actinobacteria 543
287. Looking into marine macroalgae associated bacteria to detect the presence of CAZymes 545
330. Biotechnological exploitation of *Torulaspora delbrueckii* through phenotypic and metabolic characterization 546
348. Diversity of metallophytes and metal(loid)-tolerant bacterial strains in a portuguese mine for phytotechnologies purposes 548
360. Biodiversity assessment in Marine caves of the Algarve coast and: anti-tumoral prospection of bioactive compounds produced by bacterial isolates 550
418. Potential of native microorganisms to degrade two halogenated pharmaceuticals 551
419. Ectomycorrhizal fungi inocula optimization to aid the health status of trees in the everchanging environment of cities 553
436. Comparative analysis of microbial communities of two craft beer styles 554
447. Antifungal properties of crude extracts from deep-sea- and macroalgae-associated Actinobacteria 557

3.1 Microbial physiology and biochemistry: microbial activity in the context of environmental changes 558
34. Potential of marine bacteria to biodegrade conventional and bio-based microplastics 558
60. Detection and cellular viability assessment of *Erwinia amylovora* in environmental samples from pear cv. "Rocha" orchards by immuno-flow cytometry 559
91. Haem biosynthesis in Gram-negative pathogens 561
159. Response to acetic acid stress in yeast: focus on cell wall remodeling 562
183. Production and purification of substrates for the characterization of phosphatidylinositol mannoside biosynthesis in *Mycobacterium tuberculosis* 564
186. The haem biosynthesis pathway of *Campylobacter jejuni* 565
276. Investigating how exoribonucleases and small RNAs influence 566
318. Extracellular vesicles biogenesis in cyanobacteria: towards the identification of underlying mechanisms 567
398. Impact of Climate Change on Ochratoxigenic Fungi 568
458. Enzymes and secondary metabolites profiles of Gnomoniopsis smithogilvyi are affected by chestnut medium 569

3.2 Biotechnology and environmental microbiology: from psychrophiles to extremophiles 571
20. Enrichment, isolation and characterization of acidophilic sulfate reducing bacteria from Sao Domingos mine 571
39. Bacterial food spoilage events: the first complete genome sequence of the off-flavour producer *Alicyclobacillus acidoterrestris* DSM 3922^{T} 573
51. Fungal treatment of Kraft Black Liquor using *Phanerochaete chrysosporium* and *Aspergillus uvarum* 575
63. Profiling the volatile exometabolome of *Pedobacter lusitanus* NL19 576
75. BTEX removal by *Aspergillus niger* in saline medium 577
227. Biodiversity assessment in Palaeolithic caves: the case of Escoural cave 578
260. Molecular characterization and antimicrobial properties of bioactive compounds produced by bacterial isolates from underwater caves of the Algarve coast 579
306. Recovery of heterotrophic bacteria from alkaline mine residues and their capacity to leach impurities from secondary sources of raw materials 581
312. Preliminary study on the usage of marination against common food-borne pathogens present in poultry meat. 583
340. Spatial-temporal dynamics of *Vibrio* spp. across an urban temperate estuary (River Douro estuary, NW Portugal) 585
345. Microbiome-metabolome relations in the halophyte *Salicornia ramosissima* 587

3.3 Microbiological collections: resources for a sustainable present and future 589
23. Bioprospecting bacterial symbionts of marine animals: sponge and coral-associated *Gammaproteobacteria* inhibit growth of notorious human and aquaculture pathogens 589

31. Antimicrobial peptides of *Saccharomyces cerevisiae* – a proteomic study 592
119. Microalgae: sustainable sources of nutrients 594
127. Estela Sousa e Silva Algae Culture Collection (ESSACC) – a resource of cyanobacterial strains 595
220. Characterization of the antagonistic potential of wine yeasts for biocontrol of phytopathogenic fungi in grapes 597
380. Isolation and phylogenetic identification of marine sponge-associated Actinobacteria from Mozambique and Portugal 599
382. Biotropical Resources (GHTM/IHMT NOVA biobank): Biobanking African Pediatric Upper Respiratory and Gut Microbiomes 601
441. The importance of a biological resources center in the sustainable development of a low-density region 603
445. *Faunomonas pinastri* gen. nov., sp. nov., an endophyte from a pine tree of the class *Alphaproteobacteria* 605

3.4 Soil health, food security and food safety 607
32. Lactic acid bacteria from Azeitão and Nisa PDO-cheeses: evaluation of technological and probiotic potential 607
33. *Enterococcus* spp. from Azeitão and Nisa PDO-cheeses: surveillance for antimicrobial drug resistance 608
50. Inactivation of Listeria Monocitogenes in Milk by Pulsed Electric Field (PEF) and Mild Heating 609
100. Phage Therapy for the Inactivation of *Aeromonas hydrophila* in Cockles During Depuration: *In Vitro* and *In Vivo* Preliminary Studies. 611
108. Shelf-life extension of squid and shrimp skewers through the application of vinegar solutions 613
154. Cellulose from sugarcane bagasse as a potential prebiotic agent 615
164. Light emitting diodes as an alternative disinfection method to inactivate bacteria associated with ready-to-eat salads 617
166. Microbial and sensory evaluation of hyperbaric storage at room temperature of a commercial ready-to-eat fish soup 618
168. Combination of moderated high pressure and ultrasound treatments for subsequent liquid whole egg improved thermal pasteurization 620
173. *Byssochlamys nivea* ascospore germination control by hyperbaric storage – dependence of the activation procedure 622
177. Molecular detection of species from the Boraginaceae family to safeguard food and feed safety, integrity, authenticity, and quality 624
179. Effect of *Thymus zygis* essential oil against *Listeria monocytogenes* and its application on food 626
265. Determination of the minimum inhibitory concentrations of the antibacterial oregano and thyme essential oils in the presence of polysorbate 80 628
307. Rainfall impact on soils subjected to no-tillage and crop-livestock integration treatments: insights on the microbial community succession following drought or flood using PLFA 629
327. Optimization of an innovative phagomagnetic protocol towards a selective and rapid *Listeria monocytogenes* detection 631
333. Exploring the mechanism of action of cymoxanil 633
336. Elderberries: Extraction and Application in Yogurt 634
337. Preparation and characterization of bioactive chitosan-based films incorporated with olive leaves extract for food packaging applications 635
352. Microbial growth on cheese surface covered with propolis 637
373. Integrating cutting-edge technologies to evaluate the effects of high-pressure processing on sea bass fillets quality and safety 638
390. Comparison of different preservation methods on the microbiological, texture and color properties of industrial bread during storage time 640
391. *Penicillium crustosum* as a potential OTA producer – new insights from whole-genome sequencing of strain MUM 16.125 642
399. Nitrite in meat products: alternatives from natural sources 644
443. Bioactive alternatives to mitigate foodborne pathogens 646
456. Are nitrate/nitrite free dry-cured sausages microbiologically safe? 647
475. Microalgae biomass as filler for starch films toward active and sustainable food packaging 648
476. Developing DNA-based methods to detect the presence of adulterant milk in Serra da Estrela Cheese 650

3.5 Biotech4food – Nutrigenomics, Personalized Nutrition and Food Production 652

106. Comparison of dietary fiber content of carob (*Ceratonia siliqua L.*) flour as related to seed presence and roasting effects 652
271. Effect of High Pressure Processing on Microbial Quality, Physicochemical Quality and Antioxidant Properties of Rosemary Honey During 2 Years of Storage 654
328. Protective effect of *Chlorella vulgaris* on potential probiotic lactic acid bacteria during in vitro gastrointestinal digestion 656
339. Influence of modified atmosphere packaging on multicereal bread quality and microbiological stability over storage 657
350. Optimization of Elderberry Fermentation: Screening Six 658
358. Impact of vegetable oils on Lacticaseibacillus rhamnosus and Bifidobacterium animalis subsp. lactis growth 660
363. *Fucus vesiculosus* and *Porphyra dioica* Seaweeds Cultivated in Fully Controlled Closed Systems: Proximate and Elemental Composition and Antioxidant Potential 661
429. Metagenomic characterization of bacterial and yeast communities in donkey milk fermented with kefir grains 663
461. Chemical Characterization of *Tetraselmis chuii*: 664

4.1 Teaching and Communicating in Science 666
342. A Microbiology Outreach Project Within Training in Responsible Research And Innovation 666
378. MicroMundo/Tiny Earth: an international citizen science project to fight antimicrobial resistance from universities to Basic/high school's academic communities from Center region of Portugal. 668

5.1 Genome Editing for therapy, biotechnological & food use 670
151. Isolation of novel *Chlorella vulgaris* mutants with higher biomass productivities for food and feed applications: a non-GMO strain improvement approach 670
384. Screening of Lactic Acid Bacteria strains for Electrotransformation Efficiency 672

5.2 Synthetic & Systems biology: experimental, theoretical and computational approaches for the analysis of micro and biological systems 673
111. Predictive oxidative evaluation of lipid samples using Differential Scanning Calorimetry 673
414. Reconstruction of the Metabolic Network of Lactococcus lactis strains IL1403 and LMG 19460 674

5.3 New approaches for disease control and treatment 676
8. An alternative approach to blood disinfection: photoinactivation of bacteria, fungi and viruses 676
44. Antimicrobial activity of MgO nanoparticles against *Enterococcus faecalis* using an *ex vivo* dental model 677
47. Pexiganan-nisin biogel in combination with conventional antibiotics against polymicrobial diabetic foot infections 678
64. New infection models to test drugs against nontuberculous mycobacteria 679
98. Bacteriophages for biocontrol of *Pseudomonas syringae* pv. *actinidiae*: Use of single phage suspensions and phage cocktails 681
116. Abrogation of endocytosis blocks the spread of alpha-synuclein in the yeast model of synucleinopathies 682
118. The effect of alternative sugars in the yeast *Saccharomyces cerevisiae* fitness 683
123. Resazurin Cell Viability Assay: an Effective Protocol to Assess Bacterial Inactivation by Phages 684
125. Phages for food pathogens inactivation: preliminary results in milk 685
133. Identification of new drugs for *Neisseria gonorrhoeae* using an *in silico* repurposing strategy 686
135. Influence of the water physicochemical parameters in the antimicrobial photodynamic therapy effectiveness 688
169. Pyranoanthocyanins affecting the expression of Quorum Sensing-related genes in Pseudomonas aeruginosa and Staphylococcus aureus biofilms 689
187. Carbon Monoxide Releasing Molecules and infectious diseases 690
219. Disinfection of textiles and footwear using an ultrasonic nebulizer cabinet 692
253. Repurposing of new drug candidates for Buruli ulcer treatment 694
288. Preliminary characterization of a novel antimicrobial surface coating against significant pathogens 695
290. Developing a handheld biosensor to detect Staphylococcus aureus infections 696
308. Marine Drug-Like Leads for SARS-CoV-2 Main Protease Inhibition Predicted by a Computer-Aided Drug Design Approach 698
317. Biocontrol of *Pseudomonas syringae* pv. *actinidiae* in kiwi plants using bacteriophages 700

346. Optimizing spray-drying conditions for encapsulation of the next generation probiotic *Akkermansia muciniphila* DSM 22959 _____ 702
354. Evaluation of the entomopathogenic fungus, *Beauveria bassiana* as a biocontrol agent against the chestnut moth, *Cydia splendana* in the Minho region _____ 704
408. Using yeast as a model, synthetic cannabinoids consumption might be a risk factor on the onset of Parkinson's Disease _____ 705
415. New *in vitro* models for research and drug discovery against hepatotropic pathogens _____ 706

5.4 Digital Data, Big Data & AI in Microbiotech _____ 708
256. Counter-Propagation-Artificial Neural Network and FT-MIR spectroscopy: the proper strategy for detailed antimicrobial activity analysis _____ 708

Microbiotec Sponsors _____ 710

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105. Aerobic granular sludge, a feasible technology for the treatment and recirculation of trout aquaculture water streams

Ana T. Couto [1], Catarina L. Amorim [1] and Paula M.L. Castro [1]

[1]*Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina Laboratório Associado, Escola Superior de Biotecnologia, Porto, Portugal*

Aquaculture is one of the fastest growing food production sectors. However, land-based aquaculture faces water scarcity and space restrictions which hamper its development. Aquaculture recirculation systems (RAS) help tackle these problems, although in most systems the recycling of water increases nutrient and organic matter concentrations, which often translates to fish mortality.

This work aimed to evaluate the feasibility of an aerobic granular sludge (AGS) system as a novel alternative for the treatment of aquaculture streams, characterized by low nutrient and carbon concentrations. The efficiency for nutrients removal aiming at water recirculation was assessed as well as the AGS microbiome composition dynamics over operation.

The AGS system was inoculated with mature granules from a full-scale WWTP and fed with a synthetic medium mimicking a trout farm aquaculture recycling water. High ammonium removal efficiencies of 87-100% and ammonium removal rate of approximately 14.5 mg NH_4^+-N/(L·d) were achieved. The AGS microbiome, mainly composed by members of the Proteobateria phylum, had a core microbiome composed of different functional groups (e.g. denitrifying bacteria, nitrogen fixing bacteria, ammonium oxidizing bacteria, phosphorus accumulating bacteria and extracellular polymeric substance (EPS) producing bacteria).

The AGS system was able to produce effluents of high-quality, with ammonium content below the toxic levels for fish, and thus suitable for recirculating in the aquaculture.

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